



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/509,752	09/30/2004	Norifumi Hasegawa	KON-C483	8308
7590 08/22/2007				
George A. Loud, Esquire BACON & THOMAS Fourth Floor 625 Slaters Lane Alexandria, VA 22314-1176				
		EXAMINER NGUYEN, KHANH TUAN		
		ART UNIT 1751		
		MAIL DATE 08/22/2007		
		DELIVERY MODE PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/509,752	HASEGAWA, NORIFUMI	
	Examiner	Art Unit	
	Khanh T. Nguyen	1751	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 June 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 June 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. The amendment filed on 06/28/2007 is entered and acknowledged by the Examiner. Claims 1-18 are currently pending in the instant application. New claims 19-25 are added.

Withdrawn Rejections

2. The rejection of claims 1 and 7 under 35 U.S.C. 102(b) as being anticipated by Wachsman et al. (U.S Pat. 6,235,417 hereinafter, "Wachsman") is withdrawn in view of applicant's amendments to the pending claims and in view of the persuasive arguments traversing those rejections.

The rejection of claims 2-6 and 15-16 under 35 U.S.C. 103(a) as being unpatentable over Wachsman et al. (U.S Pat. 6,235,417) in view of Guitton et al. (English Translated FR Pat. 2,547,678 hereinafter, "Guitton") is withdrawn in view of applicant's amendments to the pending claims and in view of the persuasive arguments traversing those rejections.

The rejection of claims 8-11 under 35 U.S.C. 103(a) as being unpatentable over Guitton et al. (English Translated FR Pat. 2,547,678) is withdrawn in view of applicant's amendments to the pending claims and in view of the persuasive arguments traversing those rejections.

Art Unit: 1751

The rejection of claims 8-11 under 35 U.S.C. 103(a) as being unpatentable over Guitton et al. (English Translated FR Pat. 2,547,678) in view of Wu et al. (U.S. Pub. 2003/0108785 hereinafter, "Wu") is withdrawn in view of applicant's amendments to the pending claims and in view of the persuasive arguments traversing those rejections.

Applicant's arguments with respect to claims 1-18 have been considered but are moot in view of the new ground(s) of rejection set forth below. This action is made FINAL as necessitated by the amendment.

Priority

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Applicant's Priority Documents were filed on May 16, 2003.

Information Disclosure Statement

4. The information disclosure statement (IDS) submitted on June 28, 2007 has been regarded by Examiner and made of record in the application file.

Drawings

The drawing(s) submitted on June 28, 2007 has been regarded by Examiner and made of record in the application file.

Specification

5. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Double Patenting

6. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1, 2, 4-6, 8-13 and 14-17 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-3, 5-7, 10-13, 15, and 17-22 of U.S. Patent No. 7,160,837 in view of Hasegawa. Both inventions relate to a mixed conductor of the invention includes an electron conductor made of

Art Unit: 1751

a carbon-based inorganic material with a main chain having a π bond for conduction of electrons, and a proton conductor made of an inorganic material, wherein the electron conductor and the proton conductor are attached to each other by at least one of covalent bonding, intercalation, and inclusion.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-11 and 19-25 are rejected under 35 U.S.C. 102(b) as being anticipated by Vanderborgh et al. (U.S Pat. 4,804,592 hereinafter "Vanderborgh").

With respect to claims 1-11 and 15-25, Vanderborgh discloses an electrode comprising an ion conducting material, an electron conducting material, and an electrocatalyst (Abstract). Vanderborgh's electrode is defined as a composite electrode having means for conducting ions, means for conducting electrons, and an electrocatalyst (Col. 3, lines 64-66). This disclosure is considered to read upon the limitation "mixed conductor in the form of a single material". The composite electrode is interposed between a solid ion exchange membrane and a current collector (Please refer to Fig. I). The ion conducting component of the composite electrode comprises an ion exchange polymer having a chemical composition similar to that of the ion exchange polymer used to construct the solid ion exchange membrane, e.g., Nafion®, or

Art Unit: 1751

polyperfluorocarboxylic acid polymers, considered to read upon the limitation "proton conductor", etc. (Col. 5, lines 14-28). The electron conducting component of the composite electrode comprises a material such as that utilized to construct the current collector, e.g., any suitable electron conducting material, such as nickel, graphite, or a graphite plastic composite which includes a binder, considered to read upon the limitations "electron conductor portion", "inorganic material", "carbonaceous material", "graphite", etc. (Col. 5, lines 1-13 and Col. 5, lines 28-30). The electrocatalyst can be selected from the noble metal group (Col. 5, lines 33-35).

Additionally, in lieu of the ion exchange polymer, materials exhibiting relatively high ionic conduction at high temperatures, such as phosphoric acid, or metal oxides such as iridium oxide or tungsten oxides, can be selected as the ion conducting component, considered to read upon the limitations "phosphorus-containing compounds", "proton conductor portion", etc. (Col. 5, line 64 to Col. 6, line 3).

In an embodiment, the composite electrode is formed of three separate layers, each of which comprises a mixture of carbon black, platinum or other suitable electrocatalyst dispersed and supported on carbon black, polytetrafluoroethylene as a binder, and a suitable ionic conducting material such as polyperfluorosulfonic acid. At least one layer is applied to each of the solid ion exchange membrane and current collector, and the layers are thermally bonded to each other, considered to read upon the limitation "fixed together by...covalent bonding," "intercalation" and "inclusion" (Please refer to Fig. 2 and Col. 8, lines 13-61).

Regarding claims 2 and 8, these claims contain the limitation "obtained by carbonizing..." places this claim in product-by-process form. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

The reference specifically or inherently meets each of the claimed limitations. The reference is anticipatory.

9. Claims 12-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Chen et al. (U. S. Patent No. 6,187,157 hereinafter "Chen").

With respect to claims 12-18, Chen disclose a method for producing a multiphase solid electrolyte ion transport membrane, comprising a first phase (in granulated or matrix form) comprising an ionic conductor or mixed ionic/electronic conductor, considered to read upon the limitation "mixed conductor", and a second phase comprising particles of a metal or metal oxide coating the surface of granules of the first phase. The method involves chelating metal ions into an aqueous or organic mixture comprising a polymerizable organic monomer or prepolymer, considered to read upon "high molecular precursor" and "organic compound", and a chelating agent, and heating the mixture to a temperature sufficient to polymerize the monomer or prepolymer to

Art Unit: 1751

provide a liquid polymeric composition containing the chelated metal or metal oxide particles. The liquid polymeric composition is contacted with the first phase, and mixed to form a homogenous mixture, wherein the first phase is coated with the polymeric composition. Next, the admixture is heated to a temperature sufficient to combust the polymeric composition, considered to read upon the limitation "burning the precursor" and uniformly deposit the metal or metal oxide particles onto the surfaces of the first phase granules, thus forming a multi-phase metal coated solid electrolyte powder. The powder is optionally calcined, and further processed (e.g., by sintering or cold pressing) to form the ionic transport membrane (Col. 5, line 43 to Col. 6, line 4).

The membrane comprises a matrix material that conducts at least one ion, e.g., oxygen, and at least one constituent physically distinct from the matrix material (i.e., the metal or metal oxide particles), and enhances the mechanical and/or catalytic properties of the membrane, and provides electron conductivity to the membrane, considered to read upon the limitation "electron conductor" (Col. 6, lines 5-25).

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within

Art Unit: 1751

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khanh T. Nguyen whose telephone number is (571) 272-8082. The examiner can normally be reached on Monday-Friday 8:00-5:00 EST PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Douglas McGinty can be reached on (571) 272-1029. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1751

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

the

KTN

08/17/2007


Mark Kopec
Primary Examiner